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BIRD INVENTORY OF PU'UKOHOLĀ HEIAU NATIONAL HISTORIC SITE, SOUTH KOHALA, HAWAI'I ISLAND

Technical Report 102

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ABSTRACT

Sixteen bird species were detected during four surveys made during 1992 and 1993. Two of the species (12%) were indigenous migratory shorebirds and the other fourteen (88%) were introduced non-native species. The paucity of indigenous avifauna and the complete absence of endemic species can be attributed directly or indirectly to human influences.

ACKNOWLEDGMENTS

Special thanks to Superintendent Daniel Kawaiaea, Ernest Young, and the rest of the staff for their interest and support.

INTRODUCTION

This avifauna inventory was part of a project undertaken in 1992 to describe baseline plants, birds, insects, and mammals in the three coastal National Parks in west Hawai'i.

Like most of the lowlands in Hawai'i, the vegetation of Pu'ukoholā Heiau National Historic Site has been heavily impacted by humans for hundreds of years (Olson and James 1982, Cuddihy and Stone 1990). The pristine flora prior to human contact is impossible to recreate, as is the bird fauna from the Kawaihae area next to Pu'ukoholā Heiau. However, prior to human arrival all of the lowlands on each island (excepting recent lava flows) are considered to have been covered with some sort of forest having a greater plant diversity and structure than they currently do and supporting many (extinct) avian species (Olson and James 1982, Wagner et al. 1990). Any number of historically extinct and recently discovered new fossil species may have inhabited the area (Olson and James 1991, James and Olson 1991), as well as some of the still extant native birds no longer found at such low elevations. The modification and elimination of native vegetation, introduced avian diseases, predation by humans and introduced predators, and the establishment of introduced non-native bird species are the forces that have caused these extinctions or distributional contractions. It is probable that one or more of the extinct flightless rail species (*Porzana* spp.), large extinct geese (e.g. "*Goechen*" spp.), one or more extinct or fossil species of the finch-billed drepanid genera (e.g. *Telespiza* spp., *Rhodacanthis* spp., *Chloridops* spp., *Loxioides* sp.), and certainly some of the extant "common" drepanids such as 'Apapane (*Himatione sanguinea*) and 'Amakihi (*Hemignathus virens*) once roamed the Pu'ukoholā Heiau area. One or more species of endemic crow (*Corvus* spp.) possibly visited the site and the endemic Koloa (*Anas wyvilliana*) and 'Alae ke'oke'o (*Fulica alai*) probably swam in the stream.

Only two native bird species are known to still frequent Pu'ukoholā Heiau National Historic Site. Although they were not seen by the author, the indigenous Black-crowned Night-Heron or 'Auku'u (*Nycticorax nycticorax hoactli*) is reported to occasionally visit the creek drainage, and the endemic Short-eared Owl or Pueo (*Asio flammeus sandwichensis*) sometimes hunts the grasslands of the Heiau (Ernest Young pers. comm.). Infrequently, seabirds are sighted from the shore (Reginald David pers. comm.). The shoreline near Pu'ukoholā Heiau has certainly hosted an array of seabirds and migratory shorebirds and waterbirds similar to those that have been sighted at Kaloko-Honokōhau National Historical Park and Pu'uhonua o Hōnaunau. The migratory species tend to move up and down the west Hawai'i coastline, stopping at a variety of large and small wetlands and anywhere along the shore. Rare migrants are often sighted at several places along the west Hawai'i coast within a short period of time, even within the same day.

STUDY SITE

Pu'ukoholā Heiau National Historic Site is located on the shore in South Kohala on the west coast of Hawai'i Island (Fig. 1). Kawaihae Harbor is immediately adjacent to the north and Spencer Beach County Park is adjacent to the south. The Site is administered by the National Park Service primarily for its cultural and historical significance. The area is predominantly vegetated with non-native species, although some native plants do persist or have been replanted (Macneil and Hemmes 1977, Pratt and Abbott 1996). Different habitats at Pu'ukoholā attracting a variety of bird species are: the ocean tidal shoreline, riparian vegetation and the stream, closed forest, open scrub grassland, and the irrigated lawn around the visitor center buildings.

METHODS

Due to the small size of Pu'ukoholā Heiau National Historic Site, transects and bird stations were not established. Instead, walk-through surveys of approximately an hour's duration each were conducted on four separate occasions: 22 October 1992, 21 March 1993, 20 May 1993, and 31 July 1993. The route covered included the entrance road into the Park, the Visitor Center parking lot, the trail from the Visitor Center down to the shoreline and up the creek drainage back to the highway. On one occasion the John Young house site was included in the survey loop. Except for the 22 October 1992 survey, the other three surveys were made prior to 0936 hours. Every bird detected by either vocalization or visual identification was recorded.

Two other persons with extensive birding experience at Pu'ukoholā Heiau National Historic Site were contacted and they have provided checklist input concerning the less commonly sighted species (Reginald David pers. comm., Ernest Young pers. comm.).

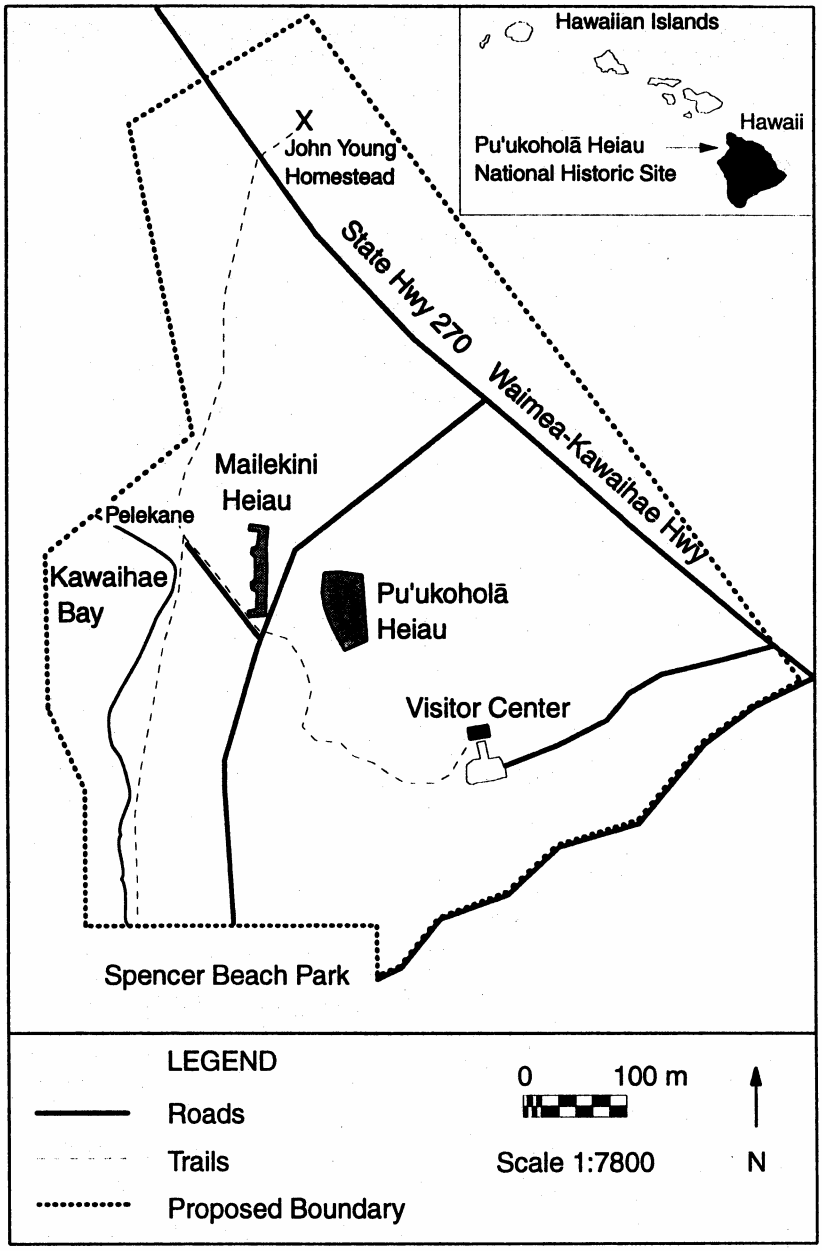

Figure 1. Roads, trails and major structures of Pu'ukoholā Heiau National Historic Site, island of Hawai'i.

RESULTS

A total of sixteen avian species was observed during the Pu'ukoholā Heiau NHS surveys (Table 1). Unlike the other two west Hawaii National Parks (Pu'uhonua o Hōnaunau and Kaloko-Honokōhau), Japanese White-eyes (*Zosterops japonicus*) were not the most common species. Instead, Common Mynas (*Acridotheres tristis*) seemed to be most abundant. Other than shorebirds, there were no native bird species seen during any of the four surveys.

All species were not detected in all months, but some of this was certainly due to factors such as differential conspicuousness during the breeding season (e.g. singing males, presence of begging fledglings) as well as the fact that common migrants such as Ruddy Turnstones or 'Akekeke (*Arenaria interpres*) and Wandering Tattlers or 'Ūlili (*Heteroscelus incanus*) should be more numerous in the fall, winter and spring months when they are visiting the Hawaiian Archipelago from their arctic breeding grounds. Both of these shorebirds were detected only during the March and May surveys.

The May and July surveys had the highests numbers of individual birds counted (88 and 76, respectively) while the October and March counts were noticeably lower (20 and 24, respectively). The greatest number of species (14) were detected during the May survey.

Table 2 is a constructed bird checklist for Pu'ukoholā. Nomenclature follows the current AOU checklist of North American birds (1983) and subsequent supplements (AOU 1993).

DISCUSSION

Pu'ukoholā Heiau NHS's resident bird assemblage currently represents many of the introduced avian species found in west Hawai'i. Although pre-human plant communities have been basically eliminated in the Kawaihae area, the current variety of juxtaposed habitats within Pu'ukoholā Heiau NHS (irrigated lawn, forested areas, riparian vegetation, tidal ocean shoreline, dry grassland) provide an assortment of resources for many types of non-native bird species. Pu'ukoholā has been cited as a good place to birdwatch for both non-native birds and migratory species (Pratt 1993).

Two native species (the 'Auku'u and Pueo) sometimes visit Pu'ukoholā Heiau NHS but are not known to nest there. Not surprisingly, both are species with large home ranges and relatively non-specialized diets.

Common Mynas, the most commonly observed species, seemed especially abundant in association with nearby Spencer Beach Park. Mynas were observed flying frequently between the two sites. Visitor use at Spencer Beach probably provides an abundance of food scraps. Because of its proximity to Spencer Beach and Kawaihae Harbor, mongoose and rat populations at Pu'ukoholā are expected to be higher than they would be otherwise.

The tidal shoreline and stream outlet at Pu'ukoholā are an important avian habitat because they provide a feeding and resting site for migratory shorebirds. These species represent the only avifauna that visitors will regularly see at Pu'ukoholā that were part of the original pristine ecosystem.

Species types and numbers will change over time if more bird species become introduced to or spread within West Hawai'i, or if management practices in the Park change. For example, the mongoose control done by Park personnel during 1993 seemed to enhance Grey Francolin (*Francolinus pondicerianus*) reproduction. Any major change in vegetation or Park use will have some impact on one or more of the avian species.

Management Recommendations

Pu'ukoholā Heiau National Historic Site is a low elevation park with significant human activity and development in the area. Its proximity to Kawaihae Harbor, which receives boat traffic from other islands, increases the probability that newly introduced bird, plant, or insect species are likely to be first detected there. I recommend that: 1) the Park should be surveyed for birds at least once a year by an ornithologist familiar with Hawaiian avifauna; 2) knowledgeable Park personnel should keep centralized permanent records and attempt to photograph or otherwise document (in a non-lethal manner) unusual bird sightings; 3) additional surveys should be organized in conjunction with established nationwide bird surveys such as the National Audubon Christmas Bird Count. However, the Christmas Count is traditionally done during late December or early January, and the baseline surveys described here indicate that May actually had the most of both numbers of bird species and total individual birds per survey. On the other hand, a winter survey would be more likely to detect migratory species along the shoreline.

Unusual bird sightings, especially of parrots, passerine birds, or game birds, should be reported to the Hawaii State Division of Forestry and Wildlife and the U.S. Fish and Wildlife Service. These agencies may themselves want to verify a particular sighting, and may recommend that the Park also notify the State Department of Agriculture if a newly introduced species is identified.

Any vegetation or habitat management (e.g. controlled burning) or changes in human activity patterns at Pu'ukoholā or the surrounding environs are likely to impact one or more bird species. For example, trapping and removing mongooses but not rats could allow the rat population to increase. Subsequently this might reduce some bird populations such as tree-nesting species which are more vulnerable to predation on eggs by rats rather than mongooses. However, some of the bigger ground-nesting species (such as Francolin) might simultaneously benefit from a reduction in mongoose numbers.

The tidal shoreline and stream outlet should be managed to minimize human disturbance thereby providing habitat for migratory shorebirds and waterbirds for feeding and resting. These restrictions are especially important during the September to May time period when the migratory species are visiting Hawai'i and when some of the endemic or indigenous waterbirds (such as Stilts [*Himantopus mexicanus knudseni*] or Black-

crowned Night-Herons) are feeding at many sites along the coast during their non-breeding season.

The variety of habitats and non-native bird species, in conjunction with the overwhelming alteration of the pristine ecosystem, provides an outstanding interpretive opportunity at Pu'ukoholā.

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TABLE 1. Cumulative numbers for species detected during four one-hour walk-through surveys at Pu'ukoholā Heiau National Historic Site. The number of surveys during which a species was detected are shown in parentheses.

Common Myna	65	(4)
Grey Francolin	25	(3)
Japanese White-eye	20	(4)
Warbling Silverbill	20	(3)
Yellow-billed Cardinal	14	(4)
Northern Cardinal	13	(4)
Zebra Dove	12	(4)
House Sparrow	9	(2)
Spotted Dove	7	(4)
House Finch	7	(4)
Ruddy Turnstone	6	(2)
Rock Dove	3	(1)
Nutmeg Mannikin	2	(1)
Wandering Tattler	2	(2)
Saffron Finch	2	(2)
Black Francolin	1	(1)
TOTAL	208	

TABLE 2. Bird Checklist for Pu'ukoholā Heiau National Historic Site

	Status	Abundance	Occurrence	Breeding
FAMILY SULIDAE				
Brown Booby or 'Ā (*Sula leucogaster plotus*)	I	R	YR	PH
FAMILY FREGATIDAE				
Great Frigatebird or 'Iwa (*Fregata minor palmerstoni*)	I	R	YR	PH
FAMILY ARDEIDAE				
Black-crowned Night-Heron or 'Auku'u (*Nycticorax nycticorax hoactli*)	I	O	YR	UB
FAMILY ANATIDAE				
Cackling Goose (*Branta canadensis minima*)	I	X	M	BE
Unidentified Goose (*Branta sp.*)	I	X	M	BE
Brant (*Branta bernicla*)	I	X	M	BE
FAMILY PHASIANIDAE				
Black Francolin (*Francolinus francolinus*)	A	U	YR	UB
Grey Francolin (*Francolinus pondicerianus*)	A	C	YR	BR

TABLE 2. Bird Checklist for Pu'ukoholā Heiau National Historic Site (Continued)

	Status	Abundance	Occurrence	Breeding
FAMILY RALLIDAE				
Coot (possibly 'Alae ke'oke'o) (*Fulica americana or F. alai*)	I or E*	X	M or YR	BE or UB
FAMILY CHARADRIIDAE				
Pacific Golden Plover or Kōlea (*Pluvialis fulva*)	I	O	M	BE
Semipalmated Plover (*Charadrius semipalmatus*)	I	R	M	BE
FAMILY SCOLOPACIDAE				
Wandering Tattler or 'Ūlili (*Heteroscelus incanus*)	I	C	M	BE
Ruddy Turnstone or 'Akekeke (*Arenaria interpres*)	I	C	M	BE
Short-billed Dowitcher (*Limnodromus griseus*)	I	X	M	BE
Sanderling or Hunakai (*Calidris alba*)	I	O	M	BE
FAMILY LARIDAE				
Ring-billed Gull (*Larus delawarensis*)	I	X	M	BE
Franklin's Gull (*Larus pipixcan*)	I	X	M	BE
Bonaparte's Gull (*Larus philadelphia*)	I	X	M	BE

TABLE 2. Bird Checklist for Pu'ukoholā Heiau National Historic Site (Continued)

	Status	Abundance	Occurrence	Breeding
FAMILY LARIDAE (CONTINUED)				
Caspian Tern (*Sterna caspia*)	I	X	M	BE
Little Tern (*Sterna albifrons sinensis*)	I	X	M	BE
Least Tern (*Sterna antillarum*)	I	X	M	BE
FAMILY COLUMBIDAE				
Rock Dove (*Columba livia*)	A	U	YR	UB
Spotted Dove (*Streptopelia chinensis*)	A	C	YR	BR
Zebra Dove (*Geopelia striata*)	A	C	YR	BR
Mourning Dove (*Zenaida macroura*)	A	O	YR	UB
FAMILY STRIGIDAE				
Short-eared Owl or Pueo (*Asio flammeus sandwichensis*)	E	O	YR	UB
FAMILY ALAUDIDAE				
Eurasian Skylark (*Alauda arvensis arvensis*)	A	X	YR	UB

TABLE 2. Bird Checklist for Pu'ukoholā Heiau National Historic Site (Continued)

	Status	Abundance	Occurrence	Breeding
FAMILY MIMIDAE				
Northern Mockingbird (*Mimus polyglottos*)	A	R	YR	UB
FAMILY STURNIDAE				
Common Myna (*Acridotheres tristis*)	A	C	YR	UB
FAMILY ZOSTEROPIDAE				
Japanese White-eye (*Zosterops japonicus*)	A	C	YR	BR
FAMILY EMBERIZIDAE				
Northern Cardinal (*Cardinalis cardinalis*)	A	C	YR	BR
Yellow-billed Cardinal (*Paroaria capitata*)	A	C	YR	BR
Saffron Finch (*Sicalis flaveola*)	A	U	YR	BR
FAMILY FRINGILLIDAE				
Yellow-fronted Canary (*Serinus mozambicus*)	A	O	YR	UB
House Finch (*Carpodacus mexicanus*)	A	C	YR	BR

TABLE 2. Bird Checklist for Pu'ukoholā Heiau National Historic Site (Continued)

	Status	Abundance	Occurrence	Breeding
FAMILY PASSERIDAE				
House Sparrow (*Passer domesticus*)	A	C	YR	BR
FAMILY ESTRILDIDAE				
Warbling Silverbill (*Lonchura malabarica*)	A	C	YR	BR
Nutmeg Mannikin (*Lonchura punctulata*)	A	U	YR	UB

CHECKLIST KEY:

Status

I - Indigenous: occurred naturally prior to humans (also called native).
E - Endemic: found naturally only in Hawaii and nowhere else in the world. A special subset of native.
A - Alien introduction by humans (also called non-native, introduced, or exotic).
* - Endangered.

Abundance

C - Common: certain to be seen in proper habitat or season.
U - Uncommon: not easily seen even though present.
O - Occasional: seen a few times a year at Pu'ukoholā.
R - Rare: seen every 2 to 5 years at Pu'ukoholā.
X - Accidental: seen only once or twice at Pu'ukoholā.

Occurrence

YR - Year round resident.
M - Migrant or vagrant: generally present from September - May.

CHECKLIST KEY: (CONTINUED)

Breeding

BR - Breeding: is known to have or is likely to have nested at Pu'ukoholā Heiau National Historic Site within the past decade.

PH - Pelagic Hawaiian seabird seen nearshore: breeds on offshore islets or Northwestern Hawaiian Islands.

BE - Breeds elsewhere outside of Hawaiian Archipelago.

UB - Unknown if breeding has occurred at or near Pu'ukoholā Heiau National Historic Site within the past decade.